

ADVENTURES
IN WESTERN NEW YORK HISTORY



Erie County

Railroads

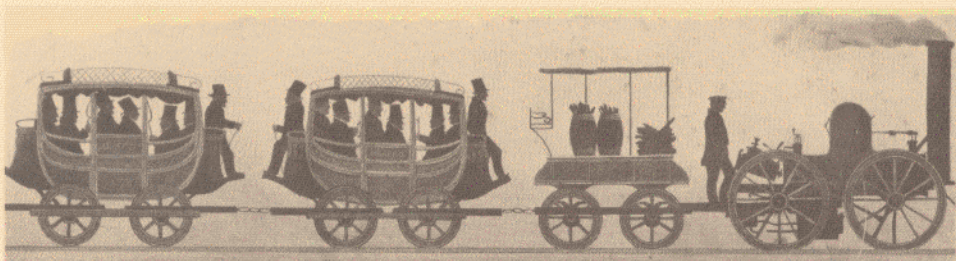
1836 • 1972

By Roger L. Squire

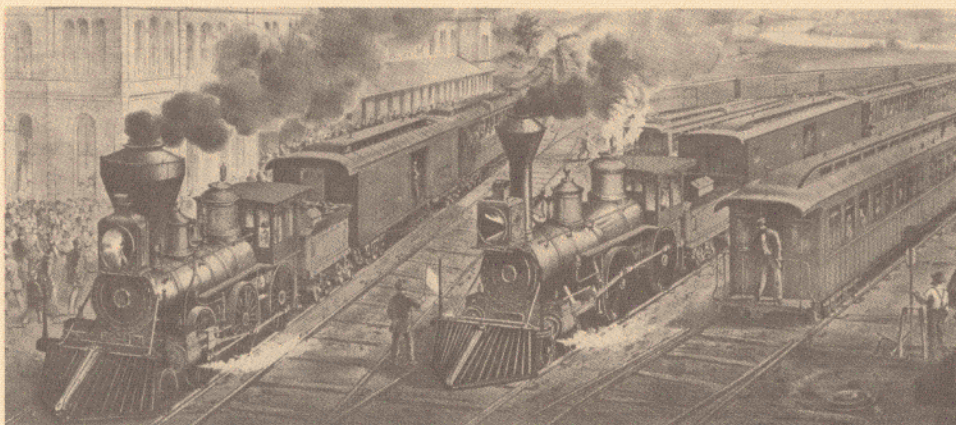
Origin and Development



BUFFALO AND ERIE COUNTY
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The De Witt Clinton, Train



Currier and Ives print, 1874: Lightning express trains leaving the junction.



The wreckage of an Erie Railroad freight train near Gowanda, N. Y.



Late nineteenth century Lehigh Valley Train

ERIE COUNTY RAILROADS: 1836-1972

Origin and Development

by Roger L. Squire

Introduction

According to the Buffalo Chamber of Commerce, in the late nineteenth and early twentieth centuries no American city owed more to the railroad than did Buffalo. In 1897, 27 railroads served the area with 600 miles of tracks within the city limits, a mileage greater than in New York, Chicago, or St. Louis. They not only brought to Buffalo the bulk of the raw materials for manufacturing, but also delivered the finished product to the market. From rail to freighter and from freighter to rail, thousands of tons of grain, coal, lumber, and iron passed through the port, making it one of the greatest inland ports in the world.

Being the northern, southern, eastern, or western terminal for a number of railroad systems, it was also a natural location for the building and repair of equipment.

At the peak of the industry over 24,000 workers were employed by the railroads themselves and several thousand more in plants which made either complete freight or passenger cars, or parts for them.

The Need

To explain the early need for railroads in Erie County, let us consider the general transportation problem on a national scale. During the first quarter of the nineteenth century, there were fewer than ten million people living within the United States. The connecting links for commerce and travel consisted only of improved and unimproved roads, the ocean, lakes and rivers, and a few canals.

The roads were impassable in bad weather and at best an expensive means of transportation, two factors which greatly limited the markets for farm and other products. For illustration, to ship from Buffalo to New York City early in the nineteenth century cost three times the market value of a bushel of wheat and six times that of a bushel of corn. Stage coach travel, though extensive, was uncomfortable and tedious. At the end of a long journey, the passenger was "too tired to stand, too sore to sit." The northern waterways, though cheaper and less tiring, were inadequate, being slow, restricted in area, and closed during the winter.

The first railroads in America, regarded as improved roads, were built for the use of vehicles on wheels, drawn by horses or cables. Though not generally acknowledged, the first such railroad was the Lewiston Incline, built in 1764 to carry goods up the escarpment at Niagara Falls. The first horse-drawn railroad in Buffalo began service in 1834.

The appearance in America of the first practical steamboat built by Robert Fulton in 1807 and of the first steam locomotive, the *Stourbridge Lion*, on the tracks of the Delaware and Hudson Canal Co. in 1829 introduced a new source of power which revolutionized transportation on both land and sea.

The First Railroads

In April, 1831, several prominent citizens of Buffalo wrote a letter to Gov. Throop suggesting that a railroad be built between Buffalo and the Hudson River, and in September a public meeting was held to promote the plan, but the railroad unfortunately never materialized.

The first steam railroad to operate in Erie County was the Buffalo and Niagara Falls, organized in 1836. The original run was between Black Rock and Tonawanda, with later extensions to Niagara Falls, Lewiston, and Lockport. There is no detailed description available of the first locomotive, the *Little Buffalo*, the second locomotive, the *Niagara*, or the passenger cars, which were four-wheeled coaches divided into two or three compartments with a total capacity of 16 or 24 passengers. It is probable, however, that the train resembled the *DeWitt Clinton*, the first train in New York State which began running from Albany to Schenectady in 1831. The Buffalo and Niagara Falls continued operations until 1855 when it was taken over by the New York Central.

The *DeWitt Clinton* train comprised a locomotive, a tender, and five coaches. The four-wheeled locomotive was primitive, consisting of a simple steam engine connected with the rear driving wheels, a boiler, a dome in which the steam gathered, and a large smokestack. The tender was a platform on wheels, carrying barrels of firewood. The five passenger cars were stage coaches placed upon flanged wheels to keep them on the track and fastened together with three links of chain between coaches. These chains made the train start with a severe jerk which tended to throw the passengers off their seats. The wood fuel gave off large cinders which burned both the passengers' clothes and the umbrellas they put up for their protection. The stopping of the train was accompanied by another severe jolt. It covered its 14 mile run in 46 minutes and was kept in service for a year before being replaced by an improved type.

In 1843, the second Erie County railroad was built: the Buffalo and Attica. This was of great importance since it connected Buffalo with the chain of minor railroads which ran across the state to Albany. It was not yet possible, however, to ride all the way or to ship goods without many transfers, one obstacle being the different widths or gauges of the tracks. This railroad was later extended to Hornellsville (Hornell) to connect with the New York and Erie Railway, then pushing its way to Dunkirk.

The Hazards of Travel

For many years travelling by train was definitely hazardous. The roadbed was poorly prepared and drained, so that it heaved and sank according to the weather. The track, which consisted of long iron bars fastened to wooden rails and secured to blocks of stone, now and then curled up under the weight of the passing train and broke through the floor of the coach. The single tracks, uncertain schedules, and poor communication systems all contributed to collisions.

It should be pointed out that before 1883 there was no standard time in the United States, so that station clocks varied not only from town to town, but also from railroad to railroad. Each train ran on a time schedule based upon that of its main terminal. Before time zones were adopted, the Buffalo Exchange Street Station featured three clocks, each with a different railroad time.

Animals also presented a real problem to the early trains. In order to avoid hitting bears, it was the practice of some lines which ran through thick woods to send a boy ahead to see whether one was waiting for the train around the curve. Cows were an even greater hazard since the right of way was not fenced in and took the train through many pastures. Until the cowcatcher was invented, many wrecks were caused by curious or indifferent cows and many lawsuits were brought against the railroads by angry farmers whose cows had come out second best in the encounter.

The most spectacular and horrible local accident occurred on December 18, 1867, as the *New York Express* of the Buffalo and Erie crossed the bridge over Big Sister Creek at Angola. In this accident, presumably caused by a bent axle, the rear car was thrown from the track by a damaged wheel, dragged across the bridge until the coupling broke and sent plunging over the embankment to the ground some 60 feet below. As the car rolled over and over, the stove overturned, setting fire to the coach. Only two passengers escaped. The second car plunged down the opposite side of the embankment when its coupling also broke. Forty persons were killed and over 50 injured.

There was much opposition to the early railroad—and many complaints about its limitations. Henry Thoreau, the philosopher, observed: “We do not ride upon the railroad; it rides upon us.” An Ohio school board called the railroad “a device of Satan to lead immortal souls to hell.” A wealthy merchant said: “If one could stop when one wanted and if one were not locked up with 50 or 60 tobacco chewers; and the engine and fire did not burn holes in one’s clothes . . . and the smell of the smoke, of the oil and of the chimney did not poison one . . . and one were not in danger of being blown sky-high or knocked off the rails—it would be the perfection of travelling.”

The Main Lines

In 1852, several more railroads came to Buffalo. The New York and Erie formed a second connection from Corning to Buffalo. The Buffalo and Rochester was extended to Buffalo by a line from Batavia, and two other railroads were completed: the Buffalo and State Line which ran southwestward along the southern shore of Lake Erie and the Buffalo and Brantford which headed north into Canada and in 1870 became the Buffalo terminal for the Grand Trunk. In 1869, a consolidation of several roads west of Buffalo was named the Lake Shore and Michigan Southern. After 1898 it was controlled by the New York Central.

The important new roads, after 1870, were the Canada Southern, established in 1873, known later as the Michigan Central; the Buffalo and Washington running from Buffalo to Emporium, Pennsylvania, in 1873, eventually absorbed by the Pennsylvania; the Buffalo and Jamestown, in 1875, later leased to the Erie; the New York, Chicago and St. Louis, or Nickel Plate, finished in 1882; the Delaware, Lackawanna and Western, opened for freight in 1882; the Buffalo, Pittsburgh and Western, in 1883, another division eventually of the Pennsylvania; the Buffalo, Rochester and Pittsburgh in 1883; and the Lehigh Valley* in 1884, leading to the anthracite coal fields of Pennsylvania. The West Shore was built in 1884, running along the west shore of the Hudson River and paralleling the New York Central across the state. It was absorbed into the New York Central in 1885. The Toronto, Hamilton and Buffalo, built in 1897, was controlled by several large companies; and the Wabash was begun in 1898, using the tracks of the Grand Trunk.

The Buffalo and Susquehanna Railroad had an origin of particular interest to Buffalonians. In 1872, Frank H. Goodyear, joined a few years later by his brother, Charles W., began to accumulate holdings of timber in north central Pennsylvania at very low prices because they were remote from streams, the established means of transporting cut logs to the mill. To overcome this handicap, he built and purchased small railroads leading to the local markets. He was one of the first, if not the first, to transport logs by rail.

With the inevitable decrease in their stands of timber, the brothers became deeply interested in their railroads and decided to develop them into an integrated system for general freight. They extended their holdings, consequently, in several directions until they controlled 285 miles of track. In the 1880's the corporation was called the Sinnemahoning Railroad, but in 1893 the name was changed to the Buffalo and Susquehanna. It was completed to Buffalo in 1907.

*While its official entrance into Buffalo is listed by the historians as 1884, it was an active force locally through the 1870's, having run its coal cars and trains over the Erie for a number of years.

Unfortunately, the railroad proved to be a financial failure. It was forty-five percent longer than the competing Buffalo, Rochester and Pittsburgh from Dubois to Buffalo and more mountainous. It also was 37 miles longer than the Pennsylvania from Driftwood to Buffalo. Furthermore, the established freight rate for coal was much less than for lumber and bark. These factors, combined with high costs, rendered it unable to pay its operating expenses and bond interest in 1910, so that it went bankrupt and was run by a trustee, or receiver, appointed by the court. The railroad was reorganized in 1913, but there was insufficient freight to justify the extension from Wellsville to Buffalo; so in 1916, it was abandoned. From this point on the railroad was profitable and finally in 1930 was sold to the Baltimore and Ohio.

Strictly Local

A small railroad of great value to local commerce was the Buffalo Creek Railroad, operated jointly for many years by the Lehigh Valley and the Erie. This road, organized in 1868*, was the sole connection between most of the harbor and the railroads entering the city, and as such played a major role in the development of the harbor. In 1883, it extended the City Ship Canal through its property to the Tifft Farm, then the great coal and lumber terminal of the Lehigh Valley, thereby adding greatly to the harbor facilities. Throughout the years the road prospered through its huge tonnage and equitable rates. It still services the waterfront, switching cars from such plants as General Mills to the Lehigh Valley, Erie-Lackawanna, Baltimore and Ohio, and Penn-Central.

The Bethlehem Steel Co. has its own railroad, the South Buffalo Railway, which also serves the Ford Stamping Plant, Buffalo Slag Co., Hanna Furnace Co., and Republic Steel.

In the late 1890's terminal roads also were built between Blasdell and Depew to relieve the congestion in the Buffalo freight yards caused by the handling of through freight between Chicago and New York.

A branch of the New York Central, known as the Belt Line, was of considerable value to local industry. Constructed in 1882, it was intended originally to serve passengers on the outskirts of Buffalo; but in time, industrial plants appeared along the tracks, and the residential areas were extended far beyond it. In 1888, an official Railway Guide said:

A stranger will do well to take a trip on the New York Central Belt Line, a loop of line 15 miles within the city. There are two trains an hour, running around the line each way. The time taken for the trip is 45 minutes. The trains depart from and arrive at the New York Central depot on Exchange St., making 20 stops en route. It is a very pleasant ride outside the thickly built part of the city, first going west along the Niagara River and parallel with the Erie Canal; then through the old town of Black Rock; then across the northern part of the

*Some authorities cite 1870 as the date of organization.

nineteenth century Gov. DeWitt Clinton planted the seed for this growth by promising the lower tier of New York counties a thoroughfare that would compensate for their loss of business to the Erie Canal. Later plans bypassed Buffalo in favor of Dunkirk in part because it was felt that Buffalo had been helped quite enough by the Canal.

The actual charter for the New York and Erie was issued by the State Legislature in April, 1832. One strange provision was that the railroad should keep within the boundaries of New York State and, without special permission, should make no connections with outside railroads. This was the basic reason for the adoption of the very wide six foot track, or gauge as it was commonly known, which was to make so many complications later on. With locomotives and cars built for this gauge, it was impossible for any part of its rolling equipment to stray from its own track. An eventual compromise permitted the tracks to dip into Pennsylvania in the east.

A discussion of railroad gauges is in order at this point. In the beginning each small railroad was free to choose any width of track since its cars and locomotives travelled only over its own line. These widths varied from a little over four feet to six feet. As the railroads connected with one another, however, and it became desirable to move the rolling stock greater distances, it was obvious that the width of the tracks must be uniform. Eventually, all the railroads of the country adopted a standard gauge of four feet, eight and a half inches, a width used by the Romans as the axle length of a cart.

At first, the Erie had great trouble raising enough money to construct and maintain its road. As with many other railroads, much of the financing came from the communities through which it passed, the isolated towns envisioning greatly improved business and communications as the result of their inclusion in a new line. Despite this cooperation, the combination of a great fire in New York City, a nation-wide panic, and general skepticism or indifference all delayed work on the Erie again and again. At one point, as a director said, "We were building a railroad to cost millions, and we hadn't enough money to buy candles." There were also many disputes between the company and the tough Irish immigrants who were building the roadbed.

In 1851, when the Erie track was finally completed across the state, celebrities from all over the country were invited to ride the first through train. Among the guests were President Millard Fillmore, Daniel Webster, Commodore Oliver H. Perry, and Gov. William L. Marcy of New York, as well as bankers, merchants, and industrialists. The Erie had its moment as the greatest railroad in the world.

Over the years, the early errors of the Erie builders were corrected. Its terminals were extended to Buffalo and to Jersey City, across the river

from New York City, and its gauge reduced to the standard four feet, eight and a half inches. In the 1860's the addition of the Atlantic and Great Western extended its western terminals into Ohio. While the total cost of the Erie was \$23,000,000 against the original estimate of \$3,000,000 its earnings also exceeded early estimates, so that it was considered a financial success. Passenger business was much more important than freight.

In 1875, the Erie built a commodious brick passenger station on Exchange Street in Buffalo, adjoining the main station of the New York Central and Lake Shore roads, and gave the New York Central strong competition for the New York traffic, its route being 15 miles shorter. Thousands of Buffalonians filled this station every weekend for popular excursions to Portage, Kinzua Bridge, Rock City, Alden, and Gowanda. It was not uncommon to see long trains crowded with members of church societies and social clubs headed for these nearby resorts.

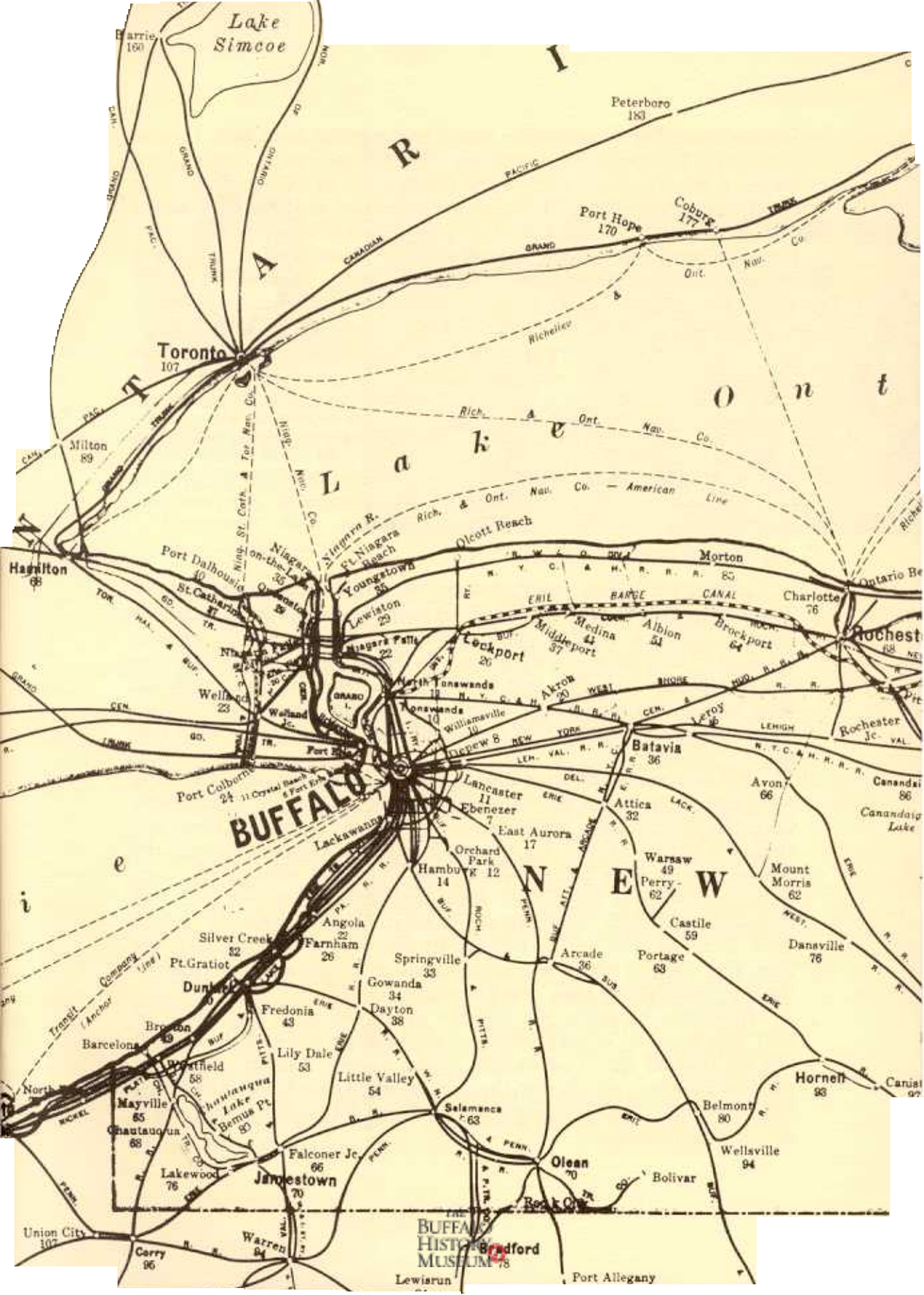
Even though it was a well run railroad, it was beset for many years with financial troubles. During the Civil War most of the northern railroads prospered, but following this prosperity the Erie suffered a long period of financial mismanagement under the notorious stock speculators: Daniel Drew, James Fisk, Jr., and Jay Gould, men of ability but few scruples.

At the end of the century, Frederick D. Underwood was appointed president by J. P. Morgan, the banker. Even though he managed the railroad soundly, it became known as "Calamity Jane" and was laughed at by many. For the next 26 years over \$174,000,000 was spent for new bridges, lesser grades, double tracking, new freight lines, and improved rolling stock. Eventually, it was almost a water level route from Meadville, Pennsylvania, to Jersey City.

In May, 1929, Charles E. Denney was named president, operating as a representative of the van Schweringen brothers. The brothers bought control of the Erie through the Chesapeake and Ohio and other sources, and planned to take it over as the eastern outlet of a huge consolidation dominated by the Chesapeake and Ohio. This dream was never realized, partly because of the crippling problems of the Depression. The Erie's operating revenue dropped from \$129,000,000 in 1929 to \$73,000,000 in 1932. The locomotive shops and car shops in Buffalo were then abandoned.

In 1938, the Erie ran out of cash and once again went into bankruptcy. During this period it was reorganized on a sound financial basis, so that for the first time in many years it had a good chance to survive both good and poor times. In June, 1942, with Robert E. Woodruff as president, the railroad declared a dividend on its common stock, the first in 69 years.

In October, 1960, to bolster their positions, the Erie and the Delaware, Lackawanna and Western merged to become the Erie-



Lackawanna. The Lackawanna was a line running from New York to Buffalo via Northern New Jersey and Northeastern Pennsylvania with a money making business derived from anthracite, or hard coal mines, in Northeast Pennsylvania. This road was important to Buffalo because of the extensive coal pockets and trestles it maintained here for reshipment. Since it burned hard coal rather than the usual bituminous, or soft coal, it was presumably the cleanest railroad in the country. From 1900 to World War I the railroad gained wide recognition as such through its witty advertising. The figure of Phoebe Snow, the typical woman passenger, and the verses describing her became familiar to millions through newspapers, magazines, and stage.

Here is the maiden all in lawn And when she left the train that night
Who boarded the train one early morn She found to her surprised delight
That runs on the Road of Anthracite Hard coal had kept her dress still white.

In the beginning, the merger was a success. In 1972, however, the general inflation, a business recession, and a disastrous flood thrust even the combined roads into bankruptcy. In this period the road was controlled indirectly by the Norfolk and Western.

The New York Central

In 1839, a trip from New York to Buffalo lasted slightly over two days. The preferred route was a Hudson River boat from New York to Albany, a train to Syracuse, an Erie canal packet to Rochester, the Tonawanda Railroad to Batavia, and a stage coach to Buffalo. In 1842, railroads connected Albany with Buffalo and, in 1853, these were consolidated into one large system, the New York Central. By 1860 the consolidated railroad had completed a double track from Buffalo to Albany with "good iron rail."

The outstanding creative force in the subsequent development of the New York Central was the Vanderbilt family, founded by Commodore Cornelius Vanderbilt, a large operator of ships in the Hudson River and along the Atlantic Coast. He became involved in railroads through the connections on Long Island between his ships and railroads. By controlling the stock of the Hudson River Railroad and the New York and Harlaem which both paralleled the Hudson River from Albany to New York, he added greatly to his fortune. He then turned his attention to the New York Central which was shipping much freight down the Hudson River in boats rather than over his railroads.

Gradually, he gained an influence in the company, and, finally in 1867, was asked by several prominent stockholders to assume control. It was felt that the New York Central needed a strong hand to survive the east and west competition with the more powerful Pennsylvania and Erie. This competition was bringing about rate wars with a consequent loss of money to all concerned.

Going Through the Tunnel.

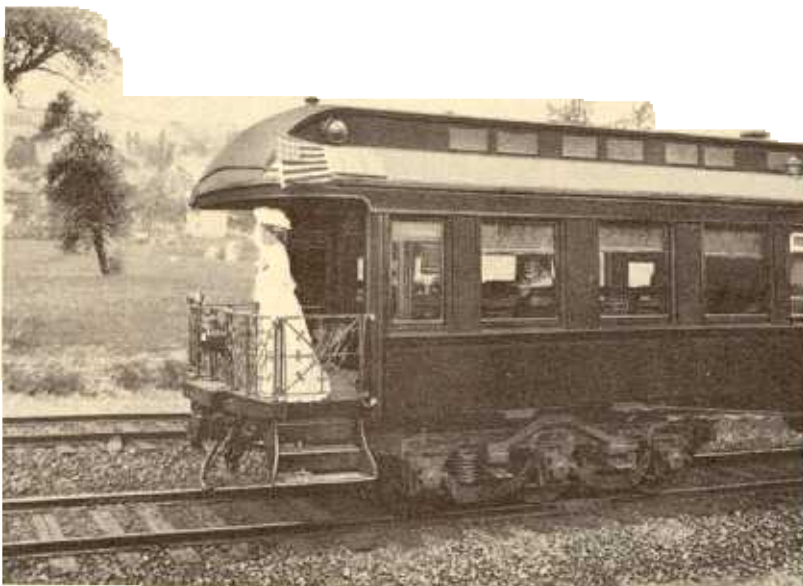


Cheap Rail Road Tickets
TO ALL PRINCIPAL POINTS AT
BARNUM'S TICKET OFFICE

No. 15 EXCHANGE STREET,

Between Main and Washington Streets,
BUFFALO, N. Y.

An early advertising card.



Phoebe Snow on the Lackawanna Daylight Flyer.

The mid-century was a period of steady expansion, first down the Hudson River to New York City and then to the west of Buffalo. William Vanderbilt, the Commodore's son, who succeeded him as president of the New York Central and Hudson River Railroad in 1877, aimed to control a line between New York and Chicago with good coverage of the territory in between. Altogether, through lease or purchase, 560 roads were eventually consolidated into the New York Central system. Among the improvements, two new tracks were laid over certain areas in 1873 to make it the first four-track road in the world.

Now firmly established as the dominant railroad in a rich and growing community, amply financed and well managed, it would seem as if the New York Central faced many prosperous years; but during the first half of the twentieth century, it shared the problems of the railroads in general, with gradually increasing costs, competition from trucks and airlines, low rates set by the government and steadily diminishing passenger traffic.

In February, 1968, in an attempt to improve its position, the New York Central merged with its oldtime rival, the Pennsylvania, under the name of Penn-Central, winning governmental approval through its promise of better service and greater efficiency. Before considering this merger, however, let us outline briefly the history of the Pennsylvania. Based in the State of Pennsylvania, this railroad never made Buffalo one of its major terminals, though it played a role in the development of Western New York.

The Pennsylvania

The building of the Pennsylvania was the outcome of an effort to save the western trade for Philadelphia, which, as a port, was losing ground rapidly to New York City, then gaining ever greater business from the Erie Canal and small local railroads. The first through train over its own tracks from Philadelphia to Pittsburgh ran on July 18, 1858, five years after the consolidation of the New York Central. Like its rival, it absorbed a number of other railroads, and eventually served most of the eastern seaboard as well as the large cities upon the Great Lakes and the Ohio and Potomac River systems.

In 1871, it acquired a New York City harbor terminal, and early in the twentieth century entered Buffalo through the acquisition of the Buffalo, New York and Philadelphia which became the Buffalo and Allegheny Division of the Pennsylvania.

Among its innovations were air conditioning; electrification, completed for its Eastern Division in 1938; the electric train telephone in 1942; the collection of less-than-carload traffic; and in 1954, the loading of truck trailers on flat cars, generally known as the piggyback service. At the time of its merger with the New York Central, it, too, was presumably a financially sound railroad, well constructed and administered.

The Penn-Central Railroad represented the logical merger of two competing giants which could apparently bolster the position of each by reducing the overhead and eliminating duplication of services, as well as unnecessary passenger and freight runs. Within less than two and a half years, in June, 1970, a series of huge losses forced it into bankruptcy.

What brought about this major tragedy? The picture is not clear. The consolidation of two staffs with different philosophies was difficult; the computer systems proved to be incompatible; and the assets of the combined roads were perhaps too complex for any one management to oversee. On the day of the merger the Penn-Central had assets of from 6.5 to 7 billion dollars. It was not only the biggest transportation company in the country, but also the biggest real estate operator. In addition, it owned pipelines, trucks, barges, buses, water companies, coal mines, factories, hotels, amusement parks, and warehouses. As of August, 1973, it was still in receivership.

The Lehigh Valley

The Lehigh Valley Railroad Company was incorporated in the State of Pennsylvania in 1846 as the Delaware, Lehigh, Schuylkill and Susquehanna Railroad Company. Many of its early routes through eastern Pennsylvania mountains followed Indian warpaths. As with most eastern roads, it gradually expanded, eventually controlling a double-track trunk line from Jersey City, New Jersey, to Buffalo, with important branch lines



Bird's-eye view of modern New York Central Station.

Interior of modern New York Central Station.

The Lehigh Valley Station.

The old New York Central Station on Exchange Street.

to Niagara Falls and numerous other terminals in New York, New Jersey, and Pennsylvania.

Much of its coal business originated from its own mines in eastern Pennsylvania, controlled by the Lehigh Valley Coal Company. Whenever it extended its roads into the coal country, it assured itself of business by buying an interest in the local coal properties. Between 1856 and 1872 its coal tonnage grew from 165,740 tons to 3,850,000; its coal cars from about 1,000 to 15,696; and the miles of main road from 46 miles to 202. To protect the company's interests in Buffalo and to facilitate the transfer of coal and other products to lake vessels from other railroads entering the city, the Lehigh bought control of the Buffalo Creek Railroad Company.

The company's assets in 1872 were \$31,923,000; in 1957, they were \$213,205,000. On December 31, 1957, the rolling stock consisted of 223 diesel, or oil burning, locomotives, 115 passenger cars, and 14,172 freight cars, 5,137 of which were for carrying coal. The total mileage was 1,580.6 miles.

In 1961, the Pennsylvania Railroad bought control of the Lehigh Valley, so that it is now part of the Penn-Central System.

Railroad Stations in Buffalo

By the 1850's all the leading railroads had Buffalo ticket offices on Exchange Street east of Main Street. In 1854, the New York Central built

platforms and a shed-like structure beside its tracks; and in 1870, opened on this site a building which became known as the Exchange Street Station. It also maintained small, secondary stations at The Terrace and in Black Rock. The Exchange Street Station, used by several other railroads, was enlarged five times from 1855 to 1907 with little concern for architectural unity or beauty. In 1929, it was replaced by the present Penn-Central Union Station east of Fillmore Avenue, off Paderewski Drive. This new terminal is an impressive building 15 stories high with a large high-ceilinged waiting room and concourse, equipped to serve 200 passenger trains every 24 hours. For a number of years it served its purpose well, but, in the 1970's, it was little more than burdensome real estate, most of the travellers having changed their allegiance to the airport and bus terminals.

Two other railroads erected modern stations in Buffalo, both of which have been abandoned. The Lehigh Valley Station, which opened in 1919 and closed in 1952, was located on Main and Scott Streets, the present location of the General Donovan State Office Building. It was a handsome building with Doric Greek columns. Its downtown tracks were bought by New York State as the right of way for the Thruway. The Lackawanna Station with elevated tracks, though abandoned, still stands beside Buffalo Creek at the juncture of Main Street and South Park Avenue. It was opened in 1917 and closed in 1962.

The Locomotive

Along with the tremendous expansion in the number of railroads, there came a corresponding improvement in the quality of service. To ride on the railroad, or to ship over it, became cheaper, faster, pleasanter, safer, and more dependable. The most important unit in this evolution was the locomotive.

Throughout the nineteenth century and the early twentieth the steam locomotive evolved steadily in speed, fuel consumption, and traction power. Following the replacement of wood with coal as fuel, the large smokestack shrank in height and diameter, the cowcatcher was added, the headlight became more powerful, and the larger firebox was moved from its location between the driving wheels and placed over a trailing truck on small wheels.

In the beginning the locomotive had difficulty going around curves until Jarvis produced a model with four small wheels on a pivoted truck in addition to the two large driving wheels. From then on the number of wheels increased in several different combinations. Little concern for the appearance of the locomotive was shown until the streamlined models appeared in the mid-twentieth century.

In 1899, Engine 999 of the New York Central's *Empire State Express* became world famous by making 112½ miles an hour on a special run between Batavia and Buffalo. Today's locomotives can reach even greater speeds, so that normal travel at from 100 to 120 miles an hour is envisioned for the near future. Among the most powerful of the late steam locomotives was the Mohawk Class L-4, driven by eight wheels each with a diameter of six feet. It weighed 387 tons and had an overall length of approximately 109 feet.

These giants were soon replaced by diesel locomotives, still more powerful and economical. The first diesel-electric was purchased in 1925 by the Central Railroad Company of New Jersey. It had many advantages over steam, among them being greater economy in the consumption of fuel, one tank of oil being the equivalent of from six to eight cars of coal. The maintenance was low; it required no hour-long firing up period; and its reversible electric motors could be used also as brakes, thus prolonging the life of the brake shoes.

The diesel engine also powered a self-propelled unit known as the rail diesel car or RDC. This consisted of a single passenger car with two diesel engines mounted under the floor, but it could be joined with other RDC's, thus creating a flexible passenger service. The 275-horsepower engines attained a maximum speed of 80 miles per hour and a cruising speed of 70 miles per hour. Such cars were used between Buffalo and Niagara Falls.

The Passenger Train

With the improvement in the locomotive came advances in the comfort, safety, appearance, and efficiency of the passenger car. Within a few years the early four-wheeled car was replaced by one with eight wheels on swivelled trucks, permitting easier passage of curves. The car also was lengthened and widened to accommodate about 60 passengers who sat in



Nineteenth century passenger car.

Mid-twentieth century lounge car.

rows facing forward on each side of a central aisle. A vestibule was added to cushion the shock if one car should crash into another during an accident, and to make passage from one car to another safer while in motion.

The first wooden cars were followed by steel frames, then complete steel cars, and finally cars made of light-weight aluminum alloys. The introduction of aluminum alloys greatly reduced the weight of the cars, and many inventions such as the Westinghouse air brake, along with improved lubrication, made the cars more efficient carriers.

Only when the short individual railroads were consolidated into statewide systems, making lengthy, non-stop journeys possible, was it necessary to provide meals and sleeping quarters. In the beginning both the Wagner Palace Cars, made in Buffalo, and the Pullman Cars were extensively used for these special purposes.

Wagner is credited with the invention of a new ventilating system, adapted to all types of car, which consisted of a superimposed roof with ventilators in its sides. Previously the passengers had suffered from very bad ventilation, an open window in the berth being an invitation to pneumonia as well as exposure to the sparks from the locomotive. In 1864, George Pullman built a sleeping car with a folding upper berth and a hinged back for the lower berth, which made it practical for both day and night accommodations. The first sleeping car was used in President Lincoln's funeral train. Pullman built his first dining car in 1866.

Esthetically both the interior and exterior of the passenger car moved from primitive simplicity to the showy extravagance of the late Victorian period, and then back to the elegant simplicity of contemporary decoration.

In 1941, the *Buffalo Courier Express* described the latest streamlined *Empire State Express* of the New York Central as follows: The two trains of 16 cars each "will consist of tavern lounge cars, parlor cars, dining cars, coaches, and observation lounge cars. Handsome murals, depicting highlight scenes in the history of New York State, will be a feature of the decorations. The new *Empire* will stop and start as a unit, the cars being equipped with twin cushion rubber draft gears and tight-locked couplers. The cars will have extra wide non-frosting windows, reclining seats, soft but brilliant individual lights for each seat, a large lounge and wash rooms at the end of each car, and air conditioning for both summer and winter operations."

During the 1930's and 1940's the railroad was both the most comfortable and the safest means of traveling. Air conditioning was introduced into passenger cars about 1930.

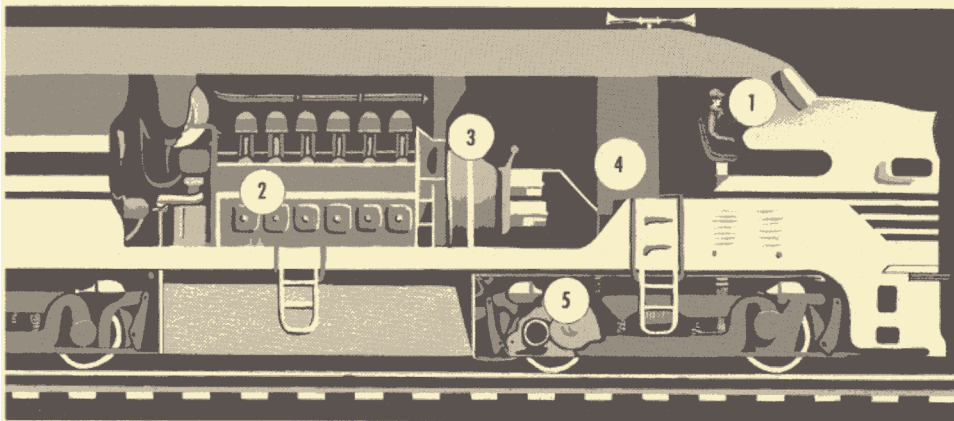
Despite all these innovations, the passenger train could not compete in the mid-twentieth century with the cheaper bus, the more convenient

automobile, or the faster airplane. One by one the railroads abandoned passenger lines and tore up the tracks until only the major areas of population were served. To continue a skeletal service, following a nationwide protest, the National Railroad Passenger Corporation, known popularly as Amtrak, was formed in May, 1971, to run the unprofitable but necessary routes. The federal law provided that service would be given on unprofitable runs only if the states requesting them would pay for two-thirds of the losses. In January, 1972, a western route from Buffalo to Chicago was discontinued for lack of riders. An eastern route between Buffalo and New York is still in use.

Sixty years ago commuters traveled regularly by train between Buffalo and the neighboring towns and summer resorts; but when the interurban trolley and the automobile took over, the transition was so gradual that there was little protest. In such centers as New York City and Philadelphia hundreds of thousands of commuters are still being transported by rail, though in many cases with government ownership or subsidy.

The Freight Train

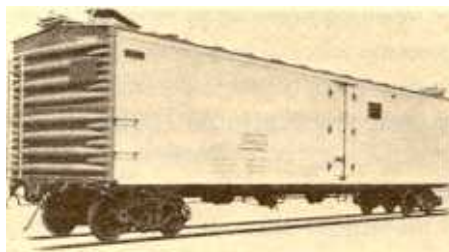
The salvation of the railroads has come about through their freight business. The constant increase in the power of the locomotive and the other improvements have resulted in longer and longer freight trains which can be run by one crew, thus offsetting the general increase in wages and other costs. The amount of freight that can be carried by a train per gallon of fuel is three times greater than that by a trailer-truck.



"In the diesel-electric locomotive when the engineer moves the throttle (1), the diesel engine (2) powered by oil fuel ignited by the heat of compression, turns the generator (3) which produces electricity. Then the control unit (4) sends electricity to axle-mounted traction motors (5) which turn the wheels. Most diesels now in use on railroads have electric transmissions and hence are called diesel-electrics" Buchanan, Steel Trains and Iron Horses, p. 129.



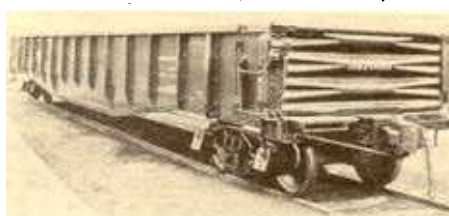
Container cars carry bulk freight in steel "boxes"



Railroad men call refrigerator cars "reefers".



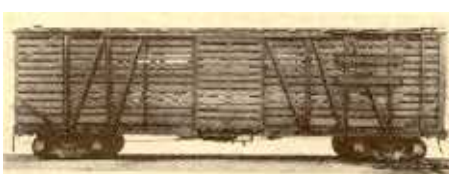
Loads of hopper cars are dropped from bottom.



Gondola cars carry coal, sand, and gravel.



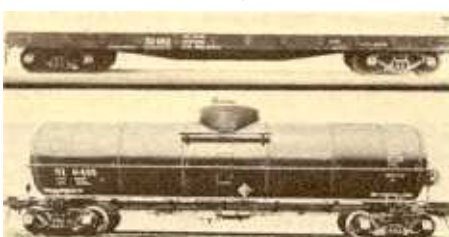
Many railroads provide "piggy-back" services



Stock cars like this carry livestock to market.



Box cars are all-purpose freight cars.



TOP—A flat car. BOTTOM—A tank car.

In the beginning the freight car was simply an enclosed box or open platform. But as the number and tonnage of commodities increased, there came an ever greater specialization. The gondola built with sides and a bottom but no top was one of the first to appear for general freight. The hopper bottom, used largely for coal, was a variation of this with hoppers at the bottom which could discharge the cargo at its destination. Other cars which appeared after the Civil War were the cattle car, the oil tanker, and the refrigerator car, the last of which enabled the railroads to move perishables such as fruit and vegetables from any one part of the country to another.

Today some of the world's fastest freight trains, known as "hotshots," built of light weight aluminum alloys and equipped with air

conditioning, serve Buffalo shippers. Late in the 1930's, to compete with trucks, the local railroads put in special trains with special cars to move goods overnight between Buffalo and New York. Averaging about 42 miles per hour and reaching at times a maximum speed of 70 miles per hour, they were as fast as passenger trains and consequently could be run over the same tracks. In 1946, such trains were making the trip in 10 hours and 50 minutes.

Beginning in 1954, the railroads recovered a sizeable part of their freight business lost to the trucks by loading truck-trailers on flat cars, so that the commodity could not only be more cheaply transported, but also more easily assembled and delivered. This service, popularly known as the Piggyback, enabled a freight handler to transfer a load from a truck to the railroad carrier in four minutes. By 1965 the New York Central also was running a daily auto train from Detroit to Buffalo with a capacity of 1,800 automobiles per train. The three level rack car was capable of carrying from 12 to 15 new automobiles. Other railroads had similar trains.

A second innovation of great promise to all transportation systems was the use of standard containers, transferrable from source to destination without unpacking, whether by truck, train, ship, or plane, or any combination of these. Altogether between 1947 and 1967 gains in the efficiency of freight handling were made in many areas. The average freight car load rose from 41 to 51 tons, the number of cars per train from 52 to 70, and the speed from 16 to 20 miles an hour, a combination which practically doubled the net ton-miles per train-hour.

In 1963, the first unit train appeared. This was a freight train which carried one commodity from the shipper to the consignee on repeated trips without changing cars or locomotives or adding a return shipment. The savings were so impressive that by 1969 over 850 such trains of coal were carried into Buffalo from the Pennsylvania coal fields, and considerable grain from the west. In 1965, the world's first unit train of hot steel slabs, comprising 86 special gondola cars, left the Bethlehem Steel mill at Lackawanna for the company's new plant at Burns Harbor, Indiana, where the slabs were fed directly into the production line. In many such trains the cars were owned or leased by the shipper and maintained for him by the railroad.

In very few industries during the mid-1960's have there been greater improvements in efficiency than in the railroads. In almost every area, computers, new machinery, and electrification have both improved and lessened the cost of service. A new tie-laying machine, for illustration, can lay two ties a minute compared with one tie an hour by a section hand. Powered tools and detector cars for locating flaws in rails also have made great savings in rail maintenance. The loading and emptying of cars have

become more efficient. In 1966, the New York Central announced that its Flexi-flo terminal off Bailey Avenue near Broadway would become an all-product terminal with pumping machinery similar to giant vacuum cleaners, capable of transferring pelletized bulk commodities from conventional cars at a rate of 1,000 pounds a minute. Even the caboose, which is the office of the conductor in charge of the train, has constantly been made more efficient and comfortable, one innovation being communication by radio between members of the crew.

Most freight trains are made up of cars from a number of different railroads with different destinations. At every terminal, consequently, it is necessary to take the train apart and reroute the individual cars. This is done through a freight classification yard in which a switching engine takes the car to a slight rise in the ground, known as "the hump," from which it is guided through a complex of switches to its new train. In the early days a "hump rider" rode each car to control its speed; but today the entire operation is carried on electronically.

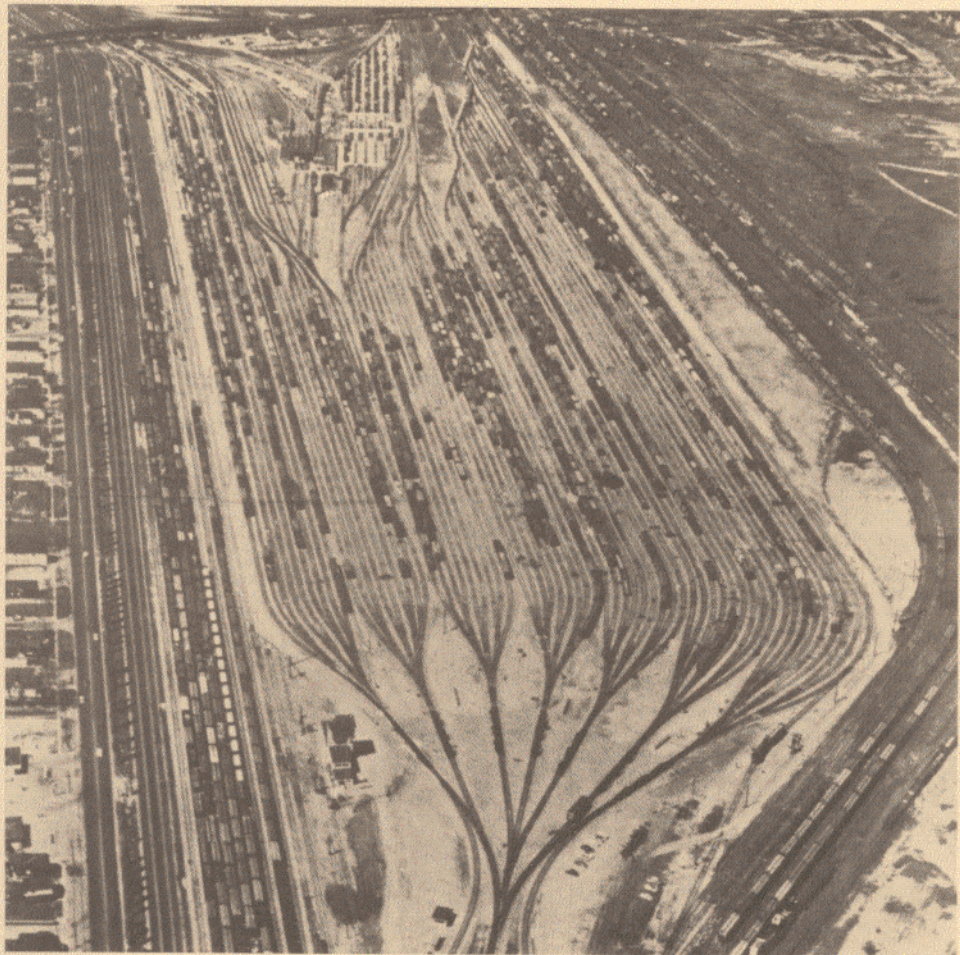
The Buffalo railroads use a number of such switching yards. The largest of these is the Frontier Yard in East Buffalo, owned by the Penn-Central. This yard was modernized in 1957 at a cost of over \$13,000,000. It covers 170 acres and can reassemble more than 3,000 cars a day. These cars are moved from one track to another by an operator in a central tower, equipped with computers.

Summary

To sum up the past 130 years of activity, the passenger train has evolved from a hazardous string of three or four open cars chugging along at 15 miles an hour, to a streamlined diesel-powered unit such as the *Twentieth Century Limited*, traveling comfortably and safely at speeds well over a mile a minute. Nevertheless, due to the competition of the bus, automobile, and airplane, the passenger business has dwindled to a trickle compared with its great periods earlier in the twentieth century. Numerous routes have been abandoned; many tracks torn up. It is probable, however, that travel by train will regain its popularity as the air becomes more polluted by its competitors, the thruways more congested, and the new jet airports necessarily placed farther and farther from the centers of population. It is hoped that a sound balance will be achieved since each form of transportation has its advantages.

The freight train has gone through an evolution in efficiency similar to the passenger train, but has retained its business since it is still the cheapest and most reliable means of transporting cargoes over a long distance by land. Altogether it is likely that the railroad, as a common carrier, will survive its present problems and play a major role in American transportation for many years to come.

Buffalo Yards, New York Central.



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